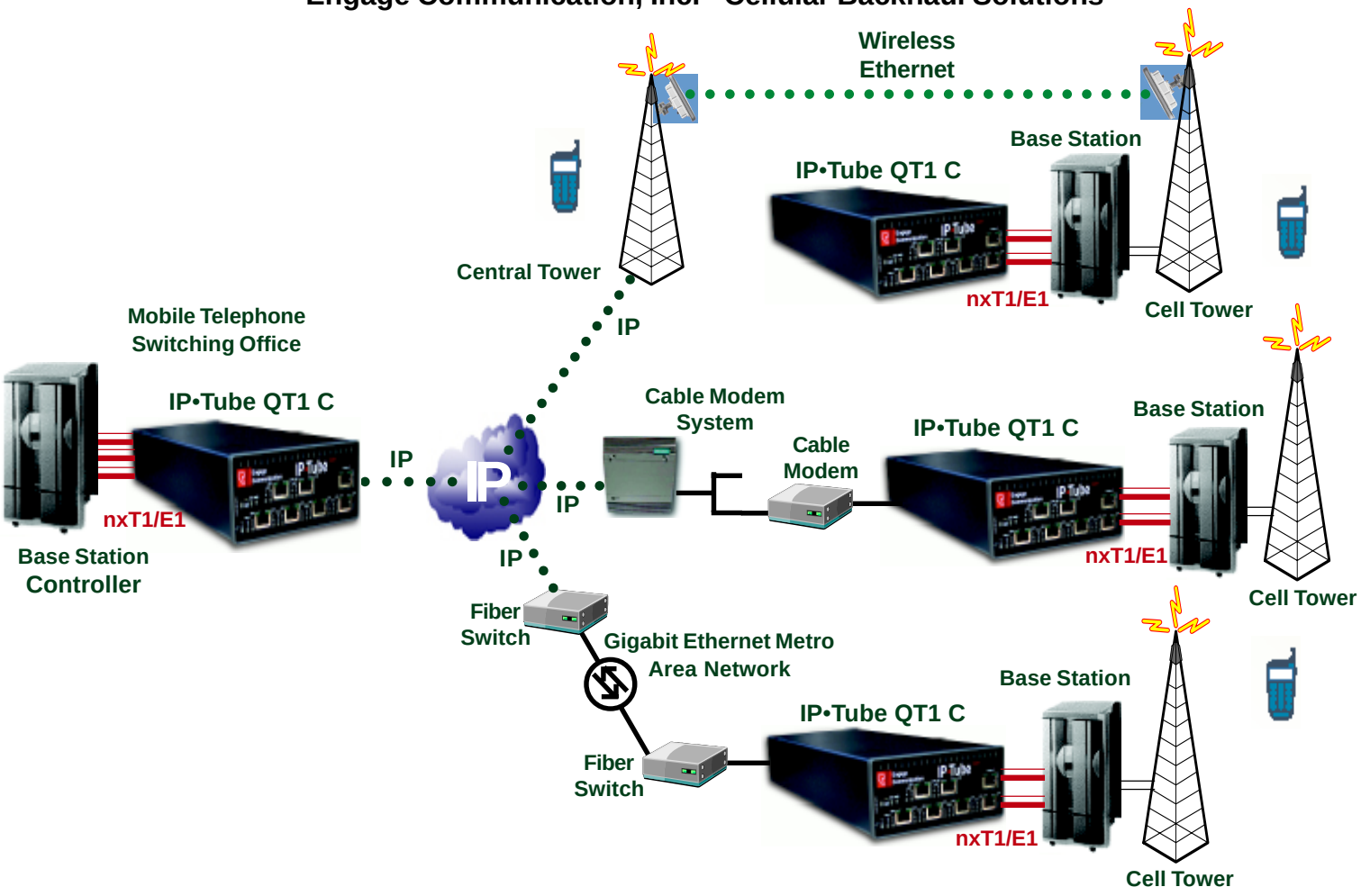
Engage Communication Application Note

Cellular Backhaul Over IP / Ethernet

Cellular phone service providers have been historically burdened with acquiring T1 or E1 circuits from Telcos to turn up cell sites. Limited availability, expensive leases, and extensive delays are all common with T1 circuits. This is no longer the case when cell sites have access to flexible IP services. IP data service providers are strategically focused on the cellular backhaul business as they have a cost basis that is a fraction of a leased T1 circuit. Cell site access to aggressively priced IP services delivered via xDSL, Optical Ethernet, HFC Cable Modem, Wireless Ethernet, and PLC Power Line Ethernet is becoming ubiquitous.

The Engage **IP•Tube T1** allows Cellular providers to leverage ubiquitous, economical, and reliable IP/Ethernet services as an alternative to T1 circuits. The **IP•Tube T1** encapsulates the Base Station's T1 traffic into IP/Ethernet packets for interconnection to the Base Station Controller. Full and Fractional T1 connections are supported. The size and frequency of the IP packets are user configurable. Data rates from 64 Kpbs to 2.048 Mbps are supported.

Engage Communication, Inc. - Cellular Backhaul Solutions



Cellular Backhaul over IP utilizing the IP•Tube T1/E1 is an economical solution that uses ubiquitous, flexible, and reliable IP/Ethernet services.

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Cellular Backhaul Over IP / Ethernet

Cellular Backhaul over IP / Ethernet Networks

The Engage Communication **IP•Tube** is used to provide transparent interconnection of the base stations (BTSs), base station controllers (BSCs) and mobile switching centers (MSCs) over IP Ethernet packet-switched networks. The **IP•Tube T1** maintains all the features of the cellular network BSC to BTS interconnections. Cellular phone service providers are able to save substantially by converting to a packet switch network from circuit TDM lease lines. The **IP•Tube T1** has duplicate packet transmission and reception features that provide for resilient performance even through a lossy interconnect. The existing deployed investments in mobile switching technologies are retained while less expensive access technologies ***maximize the Return on Investment*** for the cellular provider.

The **IP•Tube T1** transparent operation maintains the proprietary signaling required to support cellular voice communications. Voice quality is not compromised. The **IP•Tube T1** is available with one to four T1/E1 interfaces and with one to two 10/100 BaseT Ethernet interface(s). The T1 interfaces have configurations that provide independent protocol, compression, packet sizing, buffering, clocking, framing, coding and channel settings. The protocols supported are IPTube and CESoIP.

The **IP•Tube T1•C** adds the power of **lossless data compression**. This optional functionality continuously detects idle/redundant data within each DS0 resulting in as much as a 56 to 1 bandwidth savings. TDM over IP bandwidth is not consumed by silent or redundant circuits. The **IP•Tube T1•C lossless data compression** option is ideal for environments where network bandwidth is limited such as point-to-point and point-to-multipoint wireless, HFC cable modems, xDSL, Power Line Ethernet or the Internet.

Additional IP•Tube T1 Applications

- PBX/Voice over IP/Ethernet
- T1/E1 Leased Lines over IP/Ethernet
- SS7 Signaling/Monitoring over IP/Ethernet
- Serial Data (RS530, V.35, RS232, X.21) over IP/Ethernet
- Toll Bypass over IP/Ethernet
- Encrypted Data over IP/Ethernet

IP•Tube T1 Features

- 1 and 4 port T1/E1 models available
- 1 and 2 port 10/100T models available
- Optional Lossless Data Compression
- Optional Load Sharing and Redundant Ethernet port capabilities
- AC and DC Power Options
- Supports Full and Fractional T1/E1
- Straightforward Configuration

Further information on the Engage Communication IP•Tube product line can be found at www.engagecom.com. Contact Engage Technical Support for specific cabling and configuration details.

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